**Amendments to the Claims:** 

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (previously presented) An adaptive feed-back controlled cardiac

resynchronisation therapy system capable of dynamic AV delay and VV

interval pacing related to changes in the data received from at least one

hemodynamic sensor continuously monitoring а hemodynamic

performance, said system comprising:

a learning neural network module, for receiving and processing

information of said at least one sensor and for learning at least one

aspect of said hemodynamic performance body;

a deterministic algorithmic module, receiving parameters of said

resynchronisation therapy from said neural network module, and

therapeutic deliverv for delivering said means.

resynchronisation therapy, said therapeutic delivery means is

connected to said deterministic algorithmic module and operated by

it;

wherein in a non-adaptive operation mode of said system, said

deterministic algorithmic module is used for implementing a supervised

learning scheme of said learning neural network module, and wherein said

resynchronisation therapy is delivered according to parameters pre-

programmed into said deterministic algorithmic module; and

wherein in an adaptive operation mode of said system, said learning neural

network module is used for dynamically changing the parameters of said

resynchronisation therapy according to the information received from said

at least one hemodynamic sensor, and wherein said resynchronisation

therapy is delivered according to the parameters provided by said learning

neural network module.

2. (original) A system according to claim 1 wherein said modules and

therapeutic delivery means are implanted, delivering biventricular pacing

with adaptive AV delay and VV interval, modified continuously with

correlation to the hemodynamic performance of the heart.

3. (original) A system according to claim 1 wherein said neural network

module employs a spiking neuron network architecture.

4. (original) A system according to claim 1 wherein said neural network

module employs a spiking neuron network architecture implemented as a

silicon processor operating with extremely low clock frequency.

5. (original) A system according to claim 1 wherein said neural networks

module is external.

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6. (original) A system according to claim 1 wherein said at least one sensor is

a non invasive sensor.

7. (original) A system according to claim 1 wherein said therapeutic delivery

system is connected to said learning neural network module via a wireless

communications link.

8. (original) A system according to claim 1 wherein said therapeutic delivery

means is at least one selected from the group consisting of a biventricular

pacemaker and a defibrillator, a biventricular pacemaker and a CRT-D

device or any combination thereof.

(cancelled) 9.

10. (currently amended) A method for adaptive biventricular pacing control in

claim 9 comprising the steps of:

obtaining continuous signal from at least one sensor monitoring

physiological parameter of said patient;

• processing said continuous signal by an algorithmic processing

module and a learning module, and wherein said learning modules

carries out adaptive learning in connection with said at least one

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sensor is first supervised by applying an accepted set of

parameters, and

delivering a physiological signal by a delivery module in response

to said processed signal, wherein said regulation either relates to

said algorithmic process or to said learning process.

programming initial AV (atriaventricular) delay parameter and VV

(interventricular delay) interval parameter of an algorithmic

module;

• providing pacing in a non-adaptive CRT mode wherein an

algorithmic deterministic module controls the delivery of pulses,

and wherein pacing is provided according to said parameters,

switching to an adaptive CRT mode wherein said AV delay and

VV interval change dynamically in order to achieve optimal

hemodynamic performance, and wherein said adaptive mode is

limited to perform above a low limit of hemodynamic performance,

and

• switching back to the non adaptive CRT mode whenever the

hemodynamic performance is below a low limit of hemodynamic

performance or a sensor failure or any other system failure is

detected.

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(previously presented) A method for adaptive dual chamber control,

comprising the steps of:

• performing the steps 1 to 3 as set forth in claim 9 10; wherein said

delivery module is any selected from the group consisting of: a

dual chamber pacemaker and dual chamber defibrillator (ICD);

programming initial AV (atriaventricular) delay parameter of an

algorithmic module;

 operating in non-adaptive mode wherein an algorithmic

deterministic module for controlling delivery of pulses, wherein

pacing is carried out according to said parameter and wherein

learning operation with said parameters takes place;

• switching to adaptive mode whereby said AV delay changes

dynamically in order to achieve optimal hemodynamic

performance, and wherein said adaptive mode is limited to perform

above a predefined low limit of hemodynamic performance, and

• switching back to non adaptive mode whenever the hemodynamic

performance is lower than a low limit of hemodynamic

performance or a sensor fails or any other system failure is

detected.

12. (previously presented) A method for adaptive biventricular pacing control

as in claim 10 or a method for adaptive dual chamber pacing control as in

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claim 11, wherein said sensor information relates to at least one sensor

selected from the group consisting of: a ventricular pressure sensor, a

ventricular blood impedance sensor, ventricular motion

accelerometer sensor and a QT interval sensor.

13. (currently amended) A method for regulating a controlled delivery of a

physiologically active agent as in claim 9 or a method for adaptive

biventricular pacing control as in claim 10 or a method for adaptive dual

chamber pacing control as in claim 11, wherein said learning module is a

neural network module.

14. (currently amended) A method for regulating a controlled delivery of a

physiologically active agent as in claim 9 or a method for adaptive

biventricular pacing control as in claim 10 or a method for adaptive dual

chamber pacing control as in claim 11, wherein a synaptic weight learning

rule is Hebbian.

15. (currently amended) A method for regulating a controlled delivery of a

physiologically active agent as in claim 9 or a method for adaptive

biventricular pacing control as in claim 10 or a method for adaptive dual

chamber pacing control as in claim 11, wherein said learning module is a

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neural network module; wherein said neural network module employs a

spiking neuron network architecture implemented as a silicon processor

operating with extremely low clock frequency and hence dissipate

extremely low battery power.

16. (previously presented) A method for adaptive biventricular pacing control

as in claim 12, used for ventricular pacing beyond the maximal tracking rate

(MTR) limit, wherein the neural network processor is trained to predict the

atrial event timing relative to the preceding ventricular event using the

hemodynamic sensor signal that reflects ventricular contraction and where

the predicted atrial event replace the sensed atrial event when the MTR

limit is reached.

17. (previously presented) A method for adaptive biventricular pacing control

and a rate responsive atrial pacing as in claim 12, wherein said patients are

bradycardia patients, and wherein the neural network processor predicts

the optimal atrial event timing relative to the preceding ventricular event

using the hemodynamic sensor signal that reflects ventricular contraction

and where a stroke volume is optimized.

18. (previously presented) A method for adaptive biventricular pacing control

and for ventricular capture management as in claim 12, wherein the

changes in the evoked response timing are correlated with the variation in

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pacing intervals timings and hence a capture is verified reliably and an

intrinsic ventricular beat can be discriminated from a ventricular evoked

response.

19. (cancelled)

20. (cancelled)

21. (previously presented) A method for adaptive biventricular pacing control

and a rate responsive atrial pacing as in claim 13, wherein said patients are

bradycardia patients, and wherein the neural network processor predicts

the optimal atrial event timing relative to the preceding ventricular event

using the hemodynamic sensor signal that reflects ventricular contraction

and where a stroke volume is optimized.

22. (previously presented) A method for adaptive biventricular pacing control

and for ventricular capture management as in claim 13, wherein the

changes in the evoked response timing are correlated with the variation in

pacing intervals timings and hence a capture is verified reliably and an

intrinsic ventricular beat can be discriminated from a ventricular evoked

response.

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23. (previously presented) A method for adaptive biventricular pacing control as in claim 13, used for ventricular pacing beyond the maximal tracking rate (MTR) limit, wherein the neural network processor is trained to predict the atrial event timing relative to the preceding ventricular event using the hemodynamic sensor signal that reflects ventricular contraction and where the predicted atrial event replace the sensed atrial event when the MTR limit is reached.